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REMARKS

Claims 38-48 have been added to this case. Therefore, claims 1-35 and 38-48 are now pending in this case.

Claims 1-35 have been rejected under 35 U.S.C. § 103 as being unpatentable over International Publication WO 97/07272 to Rousseau. Applicants respectfully submit that this rejection cannot be sustained.[1]

Applicants' invention pertains to a method of making a fibrous electret web, which method comprises three steps: (1) wetting a fibrous web, which contains nonconductive fibers, with a wetting liquid; (2) saturating the wetted web in an aqueous polar liquid; and then (3) substantially drying the web. The fibrous web may be a woven web or a nonwoven web, and it may be used as a filter in a finished article such as a respirator or a filter cartridge. Applicants' invention differs from known charging methods in that the web is wetted with a wetting agent before being saturated with an aqueous polar liquid. The inventors discovered that the wetting step is beneficial in that it can allow a better performing filter to be provided as measured by the quality factor parameter described in the specification. The wetting step may ultimately increase the measured charged density of the fibrous web, and thus enable better filtration performance to be obtained. In addition, the method of the present invention is beneficial over known hydrocharging methods in that it can avoid placing significant mechanical stress on the fibrous product. Nonwoven webs, particularly those that contain polymeric microfibers, can be detrimentally effected by external forces. As stated in U.S. Patent 5,763,078 to Braun (copy enclosed), "a nonwoven web of polymeric microfibers is delicate and thus care must be taken when handling such a web because it can be easily compacted and torn."[2]

Rousseau describes a method of making a fibrous electret material that comprises forming a fibrous web of nonconductive thermoplastic fibers from a blend of a nonconductive thermoplastic resin and an additive.[3] After the web is formed, jets of water or a stream of water droplets are impinged onto the web at a pressure sufficient to provide the web with filtration enhancing electret charge, followed by drying.

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[1] This international publication corresponds to U.S. Patent 5,908,598, which has been cited on applicants' Information Disclosure Statement submitted on December 7, 1999.

[2] See U.S. Patent 5,763,078 at column 4, lines 47-52; Table 6; and column 22, line 62 to column 23, line 35.

[3] The additive is described as a thermally stable organic compound or oligomer that contains a perfluorinated moiety or is a thermally stable triazine compound or oligomer that contains at least one nitrogen atom in addition to those in the triazine group.

The Rousseau publication would not have made applicants' invention obvious to a person of ordinary skill for the following reasons.

Firstly, Rousseau fails to teach or suggest the basic steps of the present invention. Applicants' invention requires that the fibrous web be wetted with a wetting liquid before being saturated in an aqueous polar liquid. As defined in applicants' glossary, "wetting" means contacting or coating substantially all the surface area of the web that is desired to be wetted, and the term "wetting liquid" means a liquid that meets the Wetting Test and that dissolves in an aqueous liquid that is used to saturate the web. In order to satisfy the Wetting Test, a small drop — approximately 5 mm in diameter — is placed on a test specimen using a dropping bottle. The drop is observed for 10 seconds, and if the drop substantially soaks into the web within this time frame, then the liquid qualifies as a wetting liquid. Rousseau only describes a water impingement step; it does not teach or suggest a wetting step that occurs before a saturation step. Without any teaching or suggestion of this particular aspect of the present invention, Rousseau would not have rendered applicants' invention obvious to a person of ordinary skill.

Secondly, Rousseau does not teach or suggest the benefits of the present invention. Applicants' invention allows a web to become saturated with water without having to spray jets of water onto the web. The present invention eliminates the need for mechanical energy and for the equipment needed to carry out high-pressure spraying. Because Rousseau does not teach or suggest the wetting step of applicants' invention, it needs to use water impingement in order to achieve the water/fiber contact that is necessary to charge the web. If Rousseau would have made applicants' invention obvious to a person of ordinary skill, then Rousseau would not need to impinge jets of water on the web at high pressure to achieve fiber charging. Further, applicants' invention is beneficial in that it allows delicate webs to be charged without risking damage to the webs. The high-pressure technique of Rousseau is a substantially more forceful operation.

Thirdly, the scope and content of the Rousseau document appears to have been misinterpreted. In the Office Action, the Examiner implies that Rousseau uses fluorinated moieties as a wetting agent. This is not correct. Rousseau uses the fluorinated moieties to enhance electret charge for webs that are charged by impingement with jets of water. In order to charge non-conductive fibers using an aqueous polar liquid in a non-impingement process, the surface energy of the web should be significantly lower than the surface tension of the aqueous polar liquid. Otherwise, the web would not become charged. A liquid that spreads out easily on the web would

not be a good charging liquid. Thus, if the fluorinated moieties acted as a wetting agent, as suggested in the Office Action, this would be deleterious to charging the webs disclosed in Rousseau. Because Rousseau does not pre-wet the web with a wetting liquid to achieve intimate contact between the fiber and the polar liquid, it uses an impingement process to obtain the contact sufficient to optimize fiber charging. The fluorinated moieties in Rousseau cannot, and are not, used to enhance wetting. The fluorinated moieties in Rousseau are used for reasons detached from improving wetting: they are used to provide the resulting web with filtration enhancing electret charge. In addition, the present invention is not concerned with "attaching" polar molecules.

For the above reasons, applicants respectfully submit that this application is in condition to be allowed. Please favorably reconsider the prior art rejection and allow this application at an early date.

Respectfully submitted,

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32,900	651-736-7776
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